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EXAMINER

NATNAEL, PAULOS M

ART UNIT PAPER NUMBER

2614

DATE MAILED: 03/10/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/062,644

Applicant(s)

ALLEN ET AL.

Examiner

Paulos M. Natnael

Art Unit

2614

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 November 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15, 17, 18, 20-24, 26 and 28 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-9, 11-14, 17, 18, 20-23, 26 and 28 is/are rejected.
- 7) ☒ Claim(s) 10, 15 and 24 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 9/3/04.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims **1-9,11-14, 18,20-23,26,28** are rejected under 35 U.S.C. 102(e) as being anticipated by **Huibers et al.**, U.S. Patent Application Publication 2002/0109821 A1.

Considering claim **1**, **Huibers et al.** disclose all claimed subject matter, note;

a) an illumination source configured to direct light along an optical path, is met by light source 1, fig.2A;

b) a first color filter having a first number of color regions, is met by filter wheel 11, fig.2A.

c) a second color filter having a second number of color regions, is met by color wheel 12, fig.2A.

d) the claimed wherein the first and second color filters are configured so as to selectively adjustably cooperate in sequentially filtering the directed light to display an image, is met by the disclosure on Abstract, that "By changing the physical position or

phase of one of the filters relative to another, the brightness and color saturation of the image projected through the projection optics can be changed." Further more, as disclosed in page 4, #[0046] , "It is also possible to increase the frame rate with a multi color wheel embodiment. The phase between two color wheels (e.g. those of FIGS. 4 to 6) can be changed by more than a single segment (e.g. by rotating one wheel approximately 180 degrees relative to the other wheel) so as to result in the passage through the light beam of each color twice for each revolution of the two wheels. This is shown in the schematic of FIG. 10. In this way, it is possible for a projection system to have the flexibility of alternating between a single frame rate and a double frame rate."

Considering claim 2, the display device of claim 1, wherein the color regions of the first color filter include a red region, a green region and a blue region, is inherent in color filters, which generate primary (RGB) color images.

Considering claim 3, the display device of claim 2, wherein the red region, the green region and the blue region are of approximately equivalent size, is met by figure 5A, which illustrates equivalently sized regions;

Considering claim 4, the display device of claim 2, wherein the color regions of the second color filter include a red region, a blue region, a green region and a white region, are met by figures 5A,5B,6A,6B.

Considering claim 5, the display device of claim 4, wherein the red region, the green region, the blue region and the white region are of approximately equivalent size; see rejection of claims 3 and 4.

Considering claim 6, the display device of claim 1, wherein the first and second color filters are disposed on a carriage, the carriage being configured to selectively position at least one of the first color filter and second color filter in the optical path, is met by central shaft 7, fig.2A.

Considering claim 7, the display device of claim 1, further comprising an optical path director configured to selectively direct the optical path through one of the first color filter and the second color filter, is met by **light pipe 5**, fig.2A;

Considering claim 8, the display device of claim 1, wherein the first and second color filters are disposed along a single optical path, is met by illustrations on fig. 2A,3A, 3B,4A, 4b,

See rejection of claim 7;

Considering claim 9, the display device of claim 8, wherein the first and second color filters are coaxially coupled first and second color wheels, is met by the disclosure on page 3, #[0013].

Regarding claim 11, see rejection of claim 2-5.

Regarding claim **12**, the display device of claim 9, wherein the second color wheel is selectively fixed in a predetermined angular position while the first color wheel rotates to sequentially filter the directed light, see rejection of claim 1(d).

Regarding claim **13**, the display device of claim 9, wherein the color regions of the first and second color wheels each include a red region, a green region and a blue region, each separated by a white region, see rejection of claims 2-5;

Considering claim **14**, the display device of claim 13, wherein the first and second color wheels are selectively fixed in a specified angular alignment relative to each other and rotate together to sequentially filter the directed light.

See rejection of claim 12.

Considering claim **18**,

- a) providing an illumination source, is met by the light source 1;
- b) directing light from the illumination source along an optical path, is met by Pipe 5;
- c) sequentially filtering the directed light with at least one of plural cooperative color filters by altering the optical path to coincide with a selected one of plural color filters, is met by the disclosure on page 1, #[0013].

Art Unit: 2614

Considering claim **20**, a sequential color filter system for filtering light directed along an optical path, the sequential color filter system comprising: a first color wheel having a plurality of color regions; and a second color wheel having a plurality of color regions including at least one white region; each of the first and second color wheels being individually selectable to sequentially filter the light directed along the optical path.

See rejection of claims 1,6.

Considering claim **21**, the sequential color filter system of claim 20, further comprising a carriage whereby the first color wheel is selectively moved into and out of the optical path.

See rejection of claim 6.

Considering claim **22**, the sequential color filter system of claim 21, wherein the second color wheel is selectively moved into and out of the optical path opposite the first color wheel, is met by figures 5A and 5B and the disclosure on #[0021].

Considering claim **23**, the image display system of claim 20, wherein the first and second color wheels are coaxially coupled and disposed in the optical path, is met by the disclosure on page 3, #[0013].

Considering claim **26**, a display device comprising: an illumination source configured to direct light along an optical path; a first sequential color filter means disposed along the

optical path; and a second sequential color filter means disposed along the optical path; one of the first sequential color filter means and the second sequential color filter means being selectable for individual movement through the optical path to effect adjustable sequential filtering of the directed light to display an image.

See rejection of claim 1.

Considering claim **28**, a sequential color filter system for filtering light directed along an optical path, the sequential color filter system comprising: a first sequential color filter movable within the optical path; and a second sequential color filter movable within the optical path; the first sequential color filter and second sequential color filter each having a plurality of color regions whereby the first sequential color filter and the second sequential color filter are selectively configurable and relatively adjustable to cooperatively filter light directed along the optical path.

See rejection of claims 1-6;

3. Claims **1-8, 17-18,20-23,26,28** are rejected under 35 U.S.C. 102(e) as being anticipated by **Davis**, U.S. 6,813,087.

Considering claim **1**, **Davis** discloses all claimed subject matter, note;

a) an illumination source configured to direct light along an optical path, is met by light source 102, fig.1;

- b) a first color filter having a first number of color regions, is met by filter track 204, Fig.2, of color wheel 110, fig.1;
- c) a second color filter having a second number of color regions, is met by filter track 208, Fig.2, of color wheel 110, fig.1;
- d) the claimed wherein the first and second color filters are configured so as to selectively adjustably cooperate in sequentially filtering the directed light to display an image, is met by the disclosure on column 2, lines 49-59 that "...The method of producing a color image comprising: providing a beam of white light; providing a color filter having first track comprised of a plurality of color filters and a second track comprised of a plurality of color filters; ***moving the color filter to position one of the first and second tracks in the beam of light***, spinning the color filter to sequentially filter the beam of light; selectively modulating the filtered beam of light in response to electronic image data; and focusing the selectively modulated beam of light onto an image plane."

Considering claim 2, the display device of claim 1, wherein the color regions of the first color filter include a red region, a green region and a blue region, is inherent in color filters, which, as also taught in column 1 of Davis, produce the primary (RGB) colored images.

Considering claim 3, the display device of claim 2, wherein the red region, the green region and the blue region are of approximately equivalent size, is met by figure 2, which illustrates equivalently sized regions;

Considering claim 4, the display device of claim 2, wherein the color regions of the second color filter include a red region, a blue region, a green region and a white region, is met by the disclosure that "The first and second tracks each have a different set of color filters. One set of filters is chosen to improve image brightness, another set is selected to improve color saturation. Typically, the set of filters used to improve brightness includes one or more clear segments, while the set of filters selected to improve color saturation does not. Depending on the image being projected, the user or the display controller moves the color wheel to select a particular filter set." (col. 3, lines 55-66). [emphasis added]

Considering claim 5, the display device of claim 4, wherein the red region, the green region, the blue region and the white region are of approximately equivalent size, is also met by figure 2, which illustrates equivalently sized regions;

Considering claim 6, the display device of claim 1, wherein the first and second color filters are disposed on a carriage, the carriage being configured to selectively position at

least one of the first color filter and second color filter in the optical path, is implied because Davis teaches ***moving the color filter to position one of the first and second tracks in the beam of light.*** (col. 2, lines 54-56) and by the disclosure that ***“Depending on the image being projected, the user or the display controller moves the color wheel to select a particular filter set.”*** (col. 3, lines 60-62) That is to say, in order to move the tracks into the path of the beam of light, some sort of a mover, controller, etc. must be used. [emphasis added]

Considering claim 7, the display device of claim 1, further comprising an optical path director configured to selectively direct the optical path through one of the first color filter and the second color filter, is met by **integrating rod 104, fig.1;**

Considering claim 8, the display device of claim 1, wherein the first and second color filters are disposed along a single optical path.

See rejection of claim 7;

Considering claim 17, the claimed method of displaying an image comprising:

- a) providing an illumination source, is met by the light source 102;
- b) directing light from the illumination source along an optical path, is met by rod 104;
- c) sequentially filtering the directed light with at least one of plural cooperative color filters by selecting a first color filter, fixing a position of a second color filter in a predetermined position in the optical path and moving the first color filter relative to the

optical path, is met by the disclosure that "Depending on the image being projected, the user or the display controller moves the color wheel to select a particular filter set." (col. 3, lines 60-62; see also rejection of claim 6.

Considering claim **18**,

- a) providing an illumination source, is met by the light source 102;
- b) directing light from the illumination source along an optical path, is met by rod 104;
- c) sequentially filtering the directed light with at least one of plural cooperative color filters by altering the optical path to coincide with a selected one of plural color filters.

See rejection of claim 17 and 7.

Considering claim **20**, a sequential color filter system for filtering light directed along an optical path, the sequential color filter system comprising: a first color wheel having a plurality of color regions; and a second color wheel having a plurality of color regions including at least one white region; each of the first and second color wheels being individually selectable to sequentially filter the light directed along the optical path.

See rejection of claims 1,6,17.

Considering claim **21**, the sequential color filter system of claim 20, further comprising a carriage whereby the first color wheel is selectively moved into and out of the optical path.

See rejection of claim 6.

Considering claim **22**, the sequential color filter system of claim 21, wherein the second color wheel is selectively moved into and out of the optical path opposite the first color wheel, is met by the disclosure that "depending on the image being projected, the user or the display controller moves the color wheel to select a particular filter set." (co.. 3, lines 60-62)

Considering claim **23**, the image display system of claim 20, wherein the first and second color wheels are coaxially coupled and disposed in the optical path, is met by 1st and 2nd tracks comprising a plurality of color filters.

Considering claim **26**, a display device comprising: an illumination source configured to direct light along an optical path; a first sequential color filter means disposed along the optical path; and a second sequential color filter means disposed along the optical path; one of the first sequential color filter means and the second sequential color filter means being selectable for individual movement through the optical path to effect adjustable sequential filtering of the directed light to display an image.

See rejection of claim 1 and Fig.6;

Considering claim **28**, a sequential color filter system for filtering light directed along an optical path, the sequential color filter system comprising: a first sequential color filter

movable within the optical path; and a second sequential color filter movable within the optical path; the first sequential color filter and second sequential color filter each having a plurality of color regions whereby the first sequential color filter and the second sequential color filter are selectively configurable and relatively adjustable to cooperatively filter light directed along the optical path.

See rejection of claims 1-6;

Allowable Subject Matter


4. Claims **10,15,24** are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.
5. The following is a statement of reasons for the indication of allowable subject matter: the prior art fails to disclose a display device further comprising one or more sensors configured to sense respective first and second angular orientations to determine angular relationship between the first and second, as in claim **10**; the image display system wherein the second color wheel is selectively rotationally fixed with the white region in the optical path while the first color wheel rotates to sequentially filter the directed light, claim **24**;

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Paulos M. Natnael whose telephone number is (703) 305-0019. The examiner can normally be reached on 9:00am - 5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Miller can be reached on (703) 305-4795. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



PAULOS M. NATNAEL
PATENT EXAMINER

PMN
February 26, 2005